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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bruno Gratacos

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STRASBURGER & PRICE, LLP

ATTN: IP SECTION

1401 MCKINNEY

SUITE 2200

HOUSTON, TX 77010

EXAMINER

HUGHES, SCOTT A

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/576,827	Applicant(s) GRATACOS, BRUNO	
	Examiner SCOTT A. HUGHES	Art Unit 3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 11/12/2009 have been fully considered but they are not persuasive.

With respect to the rejections under 35 USC 101, applicant argues that claim 1 now indicates that the seismic data are obtained from an omnitilt seismic sensor, and that the data are therefore always representative of actual physically sensed data. Applicant argues that because the data are representative of physical and tangible objects, the process of claims 1-6 is patent eligible. This argument is not persuasive, as the claims do not recite any representations or images of the subsurface formations. The claims only recite processing of the data, but do not recite any steps in the process that transform the data from simply being data into being a physical and tangible representation of the subsurface formations. Although applicant recites that the data are obtained by seismic sensors, applicant has not recited any structure that performs the claimed processing steps. Therefore, the process is not tied to a particular machine or apparatus,

With respect to the rejections under 35 USC 102(b), applicant's arguments are not persuasive. Applicant that amended claim 1 specifies using seismic data corresponding to first arrival waves and to waves reflected or converted by the seismic horizons. Applicant argues that Gaiser only teaches using first arrival waves for determining the orientation of the geophones. This argument is not persuasive, as

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Gaiser specifically discloses that first arrivals, reflected waves (P wave reflections) and converted waves (PS wave reflections) (Column 4, Lines 1-11).

Applicant argues that claim 1 now specifies that the data are acquired using an omnilt sensor, meaning that none of the geophones are to remain in a particular given direction. Applicant argues that Gaiser proposes a method in which the vertical sensors remain vertical. This argument is not persuasive, as Gaiser teaches that the sensor units including the multicomponent can be misaligned when they hit the ocean bottom, and that orientation of the three component geophones can differ from one station to the next (Columns 1-2). Therefore, the sensors of Gaiser work in any position on the seafloor.

Applicant argues that Gaiser does not comprise a step of isolating various data through estimators, depending on whether they correspond to propagation with reflection or with conversion by the seismic horizons. Applicant argues that Gaiser only uses first arrivals. This argument is not persuasive, as Gaiser specifically discloses determining and using P-wave reflection data and PS (conversion) wave reflection data in addition to the first arrivals (Column 4, Lines 1-11).

Applicant argues that Gaiser does not disclose a method wherein operators to be applied to various components of sensors are determined by minimizing a deviation between reference data obtained by applying estimators to a sensor reconstruction. Applicant argues that Gaiser proposes determining the operator by minimizing energy of the first break. This argument is not persuasive, as Gaiser teaches the use of P wave reflections, P-S wave conversions, and first arrival, and teaches determining these

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different components of data. This determination and use of the different components of the data is determined by minimizing a deviation between reference data and data obtained by applying the estimators that includes P waves and P waves converted to S waves (Column 4, Lines 1-11; Column 5, Lines 1-21).

Applicant's arguments with respect to dependent claim 5 are not persuasive, as Gaiser teaches using data corresponding to first arrivals, reflected waves, and converted waves.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-6 are process claims that are not tied to a particular machine or apparatus and that do not result in a transformation of a particular article into a different state or thing. Although the claims recite that the data is acquired by means of a sensor having at least three geophone components, the claim is directed to the data and only requires the data itself and not the sensor. The method steps are all related to processing of this acquired data without reciting the machine or apparatus that performs the processing steps. Also, the processing of the data as claimed does not result in the transformation of the data into a different state or thing. Therefore, the process claims are not statutory subject matter.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Gaiser (6205403).

With regard to claim 1, Gaiser discloses a method of processing seismic data acquired by means of a sensor having at least three geophone components with an angular orientation $\phi\psi$ (Figs. 1, 4) (Column 1; Column 3, Lines 10-47), wherein estimators are determined which are combinations of these components, wherein various data are isolated, through the estimators depending on whether they correspond to propagation with reflection or with conversion (Column 1; Column 3, Line 10 to Column 5, Line 58), wherein operators to be applied to the various components of the sensor are determined for determining a sensor reconstruction, the operators being those that minimize a deviation between reference data and data obtained by applying the estimators the sensor reconstruction (Column 3, Line 10 to Column 5, Line 58), the operators thus determined being applied to the data acquired (Column 3, Line 10 to Column 5, Line 58).

With regard to claim 2, Gaiser discloses that the sensor furthermore includes a hydrophone, and that the reference data for reconstructing a vertical geophone are

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derived from the data acquired by the hydrophone (Column 1; Column 3, Line 10 to Column 5, Line 58).

With regard to claim 3, Gaiser discloses that the reference data for reconstructing a vertical geophone without hydrophone or for reconstructing horizontal geophones are derived from application of the estimators to one of the geophones of the sensor (Column 3, Line 10 to Column 5, Line 58).

With regard to claim 4, Gaiser discloses that the orientation in the horizontal plane of a geophone component is obtained by minimizing the estimator of the transverse reflection (Column 4, Lines 1-62).

With regard to claim 5, Gaiser discloses that the estimators are determined as a function of a model of isotropic propagation or including the azimuthal anisotropy.

With regard to claim 6, Gaiser discloses a method of processing seismic data acquired by means of a sensor having at least three geophone components (Column 1; Column 3, Lines 10-47), wherein estimators are determined which are combinations of these components, wherein various data are isolated, through the estimators, depending on whether they correspond to propagation with reflection or with conversion (Column 1; Column 3, Line 10 to Column 5, Line 58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gaiser as applied to claims 1-4 and 6 above, and further in view of Baigini (WO0151955).

With regard to claim 5, Gaiser does not disclose that the estimators are determined as a function of a model of isotropic propagation or including the azimuthal anisotropy. Baigini teaches using estimators to restructure the components of a sensor and teaches that the estimators are determined as a function of a model of isotropic propagation or a model including the azimuthal anisotropy (Pages 5-10). It would have been obvious to modify Gaiser to include of a model of isotropic propagation or a model including the azimuthal anisotropy as taught by Baigini in order to determine the shot geometries for the geophones dependent upon their coupling.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SCOTT A. HUGHES whose telephone number is (571)272-6983. The examiner can normally be reached on M-F 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott A. Hughes/
Primary Examiner, Art Unit 3663